



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
HAZARDOUS WASTE ENGINEERING RESEARCH LABORATORY
CINCINNATI, OHIO 45268

DATE: April 5, 1985

SUBJECT: Technical Review of "Western Processing Feasibility Study"

FROM: Eugene F. Harris, Environmental Engineer *E.F.H.*
Land Pollution Control Division

TO: Norma M. Lewis, Superfund Branch
U.S. EPA, Region X
Seattle, Washington

The material concerning the Western Processing Feasibility Study, Kent, Washington, has been reviewed by Jon Herrmann, Edward Opatken and Doug Ammon of the Land Pollution Control Division, Hazardous Waste Engineering Laboratory. Their comments are attached. The comments of Messers. Ammon and Herrmann are general, however, Mr. Opatken has commented specifically upon Volume II, Appendix G, "Methods, Assumptions, and Criteria for Groundwater Treatment Process Selection/Design". The reviewers have not made a judgement as to the merits of any of the seven options as compared to one another. A rating of the options was not done as the objective of the feasibility study is not clear to us.

It appears that the level of clean-up required has not as yet been determined. We will be pleased to provide more detailed technical comments when the option or options have been chosen and a more detailed plan for clean-up has been developed.

Attachments

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CINCINNATI, OHIO 45268

DATE: April 1, 1985

SUBJECT: Review of "Feasibility Study for Subsurface Cleanup
Western Processing, Kent Washington"

FROM: Jon Herrmann, Environmental Engineer *Jon Herrmann*
HWERL/LPCD/CB

TO: Eugene Harris, Environmental Engineer
HWERL/LPCD/CB

THRU: Don Sanning, Project Manager *D.S. 4/4/85*
HWERL/LPCD/CB

Below are my comments on the subject report. I have directed my review toward the discussions on remedial action alternatives with emphasis on the technical/engineering aspects of the alternatives discussions. Generally, my comments broadly address elements of several of the seven proposed alternatives. More detailed comments on the selected or most favored alternative(s) can be provided once the alternatives have been developed beyond their present, very conceptual stage.

1. In developing the detailed design for the surface cap for Alternative 2, the following should be considered:
 - o installation of an intrusion barrier, in association with the sand layer, to discourage burrowing animals and deep rooted plants from piercing through the synthetic membrane and compacted clay;
 - o selection of cover vegetation that is basically shallow rooted and that will enhance evapotranspiration of precipitation contacting the site;
 - o contouring of the cap so as to enhance surface runoff, but at the same time not so severe (steep) as to initiate unacceptable cap erosion;
 - o use of drainage pipes or a pipe network in the cap drainage layer so as to facilitate and control cap drainage;
 - o establishment of minimum performance or design standards for both the synthetic membrane (30 mil/50mil/100mil thickness) and compacted clay (1×10^{-7} cm/sec) in order to assure cap performance;

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- o design of the ground water extraction well system to assure that the well points do not act as a pathway for surface waters to flow into the subsurface zone. This may well be a critical design objective since the cap may be rendered ineffectual if some or all of the 340 well points provide a connection between the surface and subsurface;
 - o inclusion of a bedding layer between the synthetic membrane and compacted clay to minimize potential punctures of the synthetic membrane by clods or cobbles in the clay soil materials.
- 2. In developing the detailed design for the excavation and onsite for Alternative 3, the following should be considered:
 - o control of volatiles and fugitive dust emissions from the site during excavation and construction of the landfill;
 - o plan of action should the leak detection system show that the landfill is not acting to prevent pollutant movement through the site;
 - o methods to control subsurface waters from intruding into the landfill. Perhaps ground water pumping and treatment will be sufficient to meet this objective. Also methods to control and manage ground water intrusion in foundation area during landfill construction and operation is essential;
 - o methods to identify and manage unanticipated encounters with buried drums or other contaminated objects. Perhaps geophysical investigations have already shown that the potential for such problems does not exist.
- 3. In developing the detailed design for the PRP Alternative (Alternative 4), the following should be considered:
 - o assurance that the sub surface water treatment system will act effectively in cleansing the contaminated soils. Bench or laboratory data should be presented to support such an approach along with projections and level of cleanup over the useful life of the project;

- o demonstration of the need to, and wisdom of, directing surface waters into the sub surface water treatment system as a method of cleansing contaminated soils;
 - o assurance that the diversion barrier will encompass all of the zone of contamination. Otherwise, some contaminants may never reach the recovery wells and subsequently undergo treatment;
 - o analyses of the diversion barrier as an effective means of groundwater control. If the horizontal and vertical subsurface permeabilities are approximately equal, then little may be gained by surrounding the site. A more cost effective approach may be to increase the numbers of recovery wells being used in this alternative;
 - o utilization of asphalt pavement should be examined carefully to determine appropriate mix design to 1) minimize hydraulic conductivity and 2) enhance the ability of the asphalt to withstand cracking, heaving, and weather related attack during its useful life of this alternative.
4. In developing the detailed design for the excavation of Mill Creek under Alternative 7, the following should be considered:
- o permanent rerouting of that portion of Mill Creek considered contaminated or in contact with the contaminated portions of the site.
5. Regardless of the alternative(s) selected, emphasis should be placed, not only on acceptable detailed design, but also on control of construction quality to assure that the completed alternative complies, to the maximum extent possible, with the design. No amount of "over" design is adequate if comprehensive construction quality assurance is not part of the total remedial action.



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DATE: April 5, 1985
SUBJECT: Review of "Western Processing Feasibility Study"
FROM: Ed J. Opatken
HWERL/LPCD/CB
TO: Eugene F. Harris, Environmental Engineer
HWERL/LPCD/CB
THRU: Don E. Sanning, Project Manager *Don E. Sanning 4/9/85*
HWERL/LPCD/CB

The Appendix G for groundwater treatment for the Western Processing Feasibility was reviewed. The following comments are submitted for your consideration.

Under Technical Considerations on paragraph G-1, there were 4 factors. Actually the 4th factor, Duration of Treatment, is dependant on the treatment objectives and should not be considered as a prime factor under Technical Consideration.

Under Flow Rate on paragraph G-1, the possibility of increasing sewer size to Metro limitations by increasing the sewer size is questioned. The present size is not mentioned and normally a flow of 140 gpm would not affect sewer capacity, especially during dry weather conditions.

Underground Water Quality on p. 2. The failure to analyze the gross oxygen requirements by BOD, COD, or TOC detract from the study and prevent a more comprehensive evaluation from being made regarding organic removals. Another parameter missing from the analyses is total suspended solids (TSS). The TSS is required to determine the degree of solubility of the contaminants in the groundwater which has a significant bearing on both biological oxygen requirements and chemical requirements for precipitation. The ph of the groundwater sample was also omitted.

Under Alkaline Precipitation on p. G-10, the lime addition will also provide good clarification and unless shown otherwise, I doubt if filtration of the effluent is needed.

The use of lime results in a large increase in sludge volumes, based on municipal wastewater treatment experience. For this reason I would classify lime addition as a disadvantage because of greater sludge volumes.

I also disagree on p. G-11 that filtration is required after lime clarification, as mentioned earlier.

Under Organics Removal, Stripping p. G-13, I do not understand the statement that stripping "is not effective for removing extractable organic compounds". I know of no relationship correlating stripping with extractable organic compounds. I would agree that stripping is ineffective for high boiling (low upon pressure) organic compounds.

Under Oxidation on p. G-14, chemical oxidants have been ineffective in municipal wastewater treatment and are normally used as disinfectants rather than for gross organic removals.

Under Adsorption p. G-19, if the powdered activated carbon (PAC) removes toxic organic chemicals then the disposal should be limited to regeneration or combustion of the PAC.

Under Membrane Separation, G-19, an advantage for membrane or reverse osmosis as a treatment technique is that it is applicable to both organic and inorganic removals and as such reduces the number of treatment stages to a minimum.

Example Treatment System p. G-20, I question the cost effectiveness of including Hydrogen peroxide (H_2O_2) for chemical oxidation and granular activated carbon (GAC) as 2 treatment stages in series. The GAC can probably accomplish the same effect as H_2O_2 at little if any additional cost.

Item 5 p. G-20, lime dose is pH dependant for effective precipitation and calculations should be based on dosing to a pH of 10-11.

Item 7 p. G-20, the sizing of GAC is normally based on 0.2 lbs. of organics/lb of carbon.

Organics Removal p. G-22, the air stripping tower of 8 feet diameter appears oversized for a liquid flow of 100 gpm. I doubt the packing in this size tower is fully wet by the liquid. Chemical oxidation on p. G-22 is an expensive chemical. An operating cost sheet along with the capital costs would aid in analyzing this section.

Inorganics Removal p. G-23, again I question the need for filtration following a lime clarification step.



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DATE: April 5, 1985
SUBJECT: Review comments "Feasibility Study on Western Processing"
FROM: D. C. Ammon *D.C. Ammon*
HWERL/LPCD/CB
TO: Eugene Harris
HWERL/LPCD/CB
THRU: Don Sanning *D.E. Sanning 4/9/85*
HWERL/LPCD/CB

The Feasibility Study (FS) is weak with respect to identifying and evaluating remedial alternatives and defining the objectives of the remedial response. This FS presents seven "example" alternatives rather than developing more definitive alternatives to address site conditions and environmental problems. The level of alternative evaluation may be sufficient for negotiation with responsible parties; however, it is not adequate to justify a fund-financed response.

Overall the FS does an excellent job describing the site and the example alternatives. The endangerment assessment should identify and summarize possible human exposure points and location of potentially affected human populations including future uses of land, ground water and surface water, if any. If the major justification for cleanup is environmental protection in the Mill Creek, then the alternatives should focus more directly on effects in the Mill Creek.

One alternative should address on-site compliance with RCRA such as Alternative 5, except with on-site landfilling.

The report does not follow the flow chart presented in Figure 1-2, "Feasibility Study Process".